

CLAIMS

1. A steel tube for reinforcing a automobile door, having a composition comprising:

0.05 to 0.30 mass % of C;

0.01 to 2.0 mass % of Si;

1.8 to 4.0 mass % of Mn;

0.005 to 0.10 mass % of Al; and

the remainder as Fe and unavoidable impurities,

wherein the steel tube has tensile strength of no less than 1000 MPa and is excellent in three-point-bending property.

2. A steel tube for reinforcing a automobile door according to claim 1, wherein the steel tube has a structure which is constituted of martensite and/or bainite, and the martensite and/or bainite is a transformation product obtained as a result of transformation of a deformed austenite.

3. A steel tube for reinforcing a automobile door according to claim 1, wherein the steel tube has a structure which is a mixture of martensite and/or bainite and ferrite, and the martensite and/or bainite is a transformation product obtained as a result of transformation of a deformed austenite.

4. A steel tube for reinforcing a automobile door according to claim 3, wherein the content of ferrite, expressed as the area ratio, is no more than 20 %.

5. A steel tube for reinforcing a automobile door according to claim 1 to 4, wherein the yield ratio of the steel tube is no larger than 80 %.

6. A steel tube for reinforcing a automobile door of any according to claims 1 to 4, wherein the steel tube has at least one composition selected from the

group consisting of composition A, composition B and composition C described below, in addition to the aforementioned composition.

Composition A: at least one type of element selected from the group consisting of: no more than 1 mass % of Cu; no more than 1 mass % of Ni; no more than 2 mass % of Cr; and no more than 1 mass % of Mo.

Composition B: at least one type of element selected from the group consisting of: no more than 0.1 mass % of Nb; no more than 0.5 mass % of V; no more than 0.2 mass % of Ti; and no more than 0.003 mass % of B.

Composition C: at least one selected from the group consisting of: no more than 0.02 mass % of REM; and no more than 0.01 mass % of Ca.

7. A method of producing a steel tube for reinforcing a automobile door, comprising the steps of:

preparing a mother steel tube having a composition which includes: 0.05 to 0.30 mass % of C; 0.01 to 2.0 mass % of Si; 1.8 to 4.0 mass % of Mn; 0.005 to 0.10 mass % of Al; and the remainder as Fe and unavoidable impurities;

subjecting the mother steel tube to a heating or soaking treatment; and

thereafter, subjecting the mother steel tube to a diameter-reducing rolling process in which the total diameter-reduction rate is no less than 20 % and the temperature at which the diameter-reducing rolling process is finished is no higher than 800 °C.

8. A method of producing a steel tube for reinforcing a automobile door according to claim 7, wherein the steel tube has at least one composition selected from the group consisting of composition A, composition B and composition C described below, in addition to the aforementioned composition.

Composition A: at least one type of element selected from the group consisting of: no more than 1 mass % of Cu; no more than 1 mass % of Ni; no more than 2 mass % of Cr; and no more than 1 mass % of Mo.

Composition B: at least one type of element selected from the group consisting of: no more than 0.1 mass % of Nb; 0.5 mass % of V; no more than 0.2 mass % of Ti; and no more than 0.003 mass % of B.

Composition C: at least one selected from the group consisting of: no more than 0.02 mass % of REM; and 0.01 mass % of Ca.